

UNITED STATES MARINE CORPS
Basic Officer Course
The Basic School
Marine Corps Combat Development Command
Quantico, Virginia 22134-5019

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BASIC LIFE SUPPORT**Student Handout**

1. **Overview.** The physical process of breathing and blood circulation is so automatic and natural that a person is hardly aware of it. However, if the process were to be interrupted for even a few minutes, a victim would progressively pass through stages of discomfort, unconsciousness, brain damage, and death. An understanding of the cardiopulmonary process will help you select the proper course of action when confronted with a casualty whose breathing and/or heart has stopped.

2. **Oxygen is vital to all of the body's cells.** Without it, the cells quickly deteriorate and die. The rate at which various cells deteriorate depends on their structure, function, and location. The cells of the brain and nervous system die in four to six minutes. (See Figure 1.)

Figure 1. Brain damage timeline

3. Since the brain and nervous system control the other body functions, any interruption in the cardiopulmonary process is extremely dangerous. Opening the airway, giving rescue breathing, and performing cardiopulmonary resuscitation (CPR) move lifesaving oxygen to the brain and other organs. For convenience of memory, we call this the ABCs of basic life support. (See Figure 2.)

Figure 2. Basic life support ABCs

4. **Primary Assessment.** First, we must have a procedure for determining what treatment an apparent victim requires. This is known as the primary assessment. It allows us to rapidly check the most vital functions, breathing and heart activity, and enables us to decide exactly what to do next. It begins by gently tapping the victim to check for consciousness, shouting "help" to alert someone to your situation and to summon aid, and then positioning the victim on his or her back. The rest of the assessment always follows the order shown in Figure 3.

Figure 3

Open the airway . . . Check for breathing . . . Give two breaths
 . . . Look, listen, and feel . . . Check the pulse

a. Open the airway. Figure 3 shows opening the airway performed immediately after positioning the victim. This is necessary because there is a natural tendency for the tongue to fall back and close off the airway in an unconscious victim. We use the head tilt/chin lift technique to open the airway.

(1) Head tilt/chin lift technique

(a) Place the hand nearest the victim's head on his forehead and apply firm backwards pressure with your palm to tilt the head backward.

(b) Place the fingers of your other hand under the bony part of his or her lower jaw at the chin and lift to bring the chin forward.

(2) If a neck/back injury is suspected, do not move the head or neck but use the mouth-to-nose technique, which will be discussed later.

b. Check for breathing. Once the airway is open we "look, listen, and feel" for breathing. "Look, listen, and feel" means placing the side of our face close to the victim's mouth, looking at his or her chest for movement, listening for escaping air, and feeling for exhalation on the side of our face.

c. Give two breaths. Next we give two full breaths to the victim. Seal your mouth over the victim's mouth. The nose of the victim should be pinched while giving breaths, and released immediately afterwards.

d. Look, listen, and feel. After giving two breaths, we check to make sure we were effective in inflating the victim's lungs and are not hampered by an obstructed airway.

e. Check the pulse. The last step of the primary assessment is to check the carotid pulse. Find the center line of the victim's neck with your index and middle finger, then slide them into the groove on the side of the neck closest to you. Feel for a pulse for five to ten seconds. This step completes our assessment.

5. Early in our primary assessment, when attempting to give two breaths, we may find that the victim's airway is obstructed. Obviously, we must correct this problem before we can attempt any other treatment. If our attempted breaths will not inflate the victim's lungs, we suspend our primary assessment at this point and concentrate on clearing the airway before continuing.

Note: Involuntary muscular action may cause chest movement even when the airway is obstructed. Therefore, it is easy to be misled into thinking that a casualty is adequately breathing by merely watching the victim's chest rise and fall. Remember to listen and feel as well as look.

a. Abdominal thrusts - unconscious victim. (See Figure 4.)

(1) Open the airway using the head tilt/chin lift method.

(2) Attempt two mouth-to-mouth or mouth-to-nose breaths (ventilations).

(3) If unsuccessful in ventilating the victim, quickly reposition the victim's head and neck using the head tilt/chin lift method again.

(4) Attempt again to ventilate the unconscious victim with two breaths. If successful, continue mouth-to-mouth or mouth-to-nose resuscitation until he or she resumes unassisted breathing. Keep the person calm and transport him or her to the nearest medical facility.

(5) If unsuccessful in dislodging the obstruction, attempt six to ten abdominal thrusts.

(a) Kneel at his or her side or straddle the individual.

(b) Place one of your hands on top of the other with the heel of the bottom hand in the middle of the abdomen, slightly above the navel and below the rib cage.

(c) Move forward so that your shoulders are directly over the victim's abdomen and press toward the diaphragm with a quick thrust.

(d) Attempt six to ten abdominal thrusts.

(6) Check the mouth for objects using the finger sweep.

(a) Turn the head up and open the mouth by placing your thumb on the tongue.

(b) Pull the jaw out and down toward the chin.

(c) Sweep deeply into the mouth and along the cheek with a hooked finger.

(7) Attempt to give two breaths.

(8) Continue with abdominal thrusts, sweeps, and breaths until trained medical personnel arrive.

b. Abdominal thrusts - conscious victim. Abdominal thrusts are also effective in treating a conscious choking victim. The technique is altered to accommodate the victim, who should be moved to a standing position if not already so. (See Figure 4.)

(1) If the victim can speak, even slightly, or cough forcefully on demand, he has the capability to breathe sufficiently. Keep him calm and get him to the nearest medical facility where the object can be removed by skilled medical personnel.

(2) If the person cannot speak or can cough only weakly, he or she will be unable to get sufficient oxygen on which to live. Explain quickly to him and the others present (while you are positioning yourself at the side and slightly behind) that the procedures you are going to attempt must be performed immediately to save the victim's life.

(a) Stand behind the victim, wrap your arms around the person's waist and place the thumb side of your fist against the individual's abdomen slightly above the navel and below the tip of the breastbone.

(b) Compress the victim's abdomen with a quick upward thrust toward your shoulders.

(c) Attempt abdominal thrusts until the obstruction is cleared or the victim becomes unconscious.

Figure 4. Abdominal thrusts (conscious and unconscious victim)

c. Chest thrust. The chest thrust is used as an alternate technique to the abdominal thrust in cases of advanced pregnancy, or by small persons on large victims when it is impossible to encircle the victim's abdomen.

(a) Place both hands in the middle of the sternum, making sure the hands are above the lower tip of the breastbone (xiphoid tip).

(b) Exert quick thrusts with the hands which will compress the chest cavity.

(c) Attempt chest thrusts until the victim begins to breathe, cough, or loses consciousness. Remember, this technique may not be as effective as the abdominal thrusts because air is not pushed out as forcefully.

6. **Rescue Breathing.** Once you have cleared the airway or your primary assessment reveals that the victim has a pulse, is not breathing but does have a clear airway, perform rescue breathing. Remember, if you come upon an unconscious victim, **YOU WILL ALWAYS BEGIN WITH A PRIMARY ASSESSMENT.** Assuming this is the case, you will do the following:

a. Mouth-to-mouth rescue breathing

- (1) Determine unresponsiveness. Tap or gently shake the person, and ask if he or she is okay.
- (2) Call for help.
- (3) Turn or position the casualty on his back on a firm surface.
- (4) Use the head tilt/chin lift method to open the airway.
- (5) Check for breathing. Look, listen, and feel.
- (6) If there is no sign of breathing, pinch the nose, seal the mouth with yours, and give two full breaths.
- (7) Check for pulse.
- (8) If the casualty has a pulse, continue to deliver 12 breaths per minute or ONE BREATH EVERY FIVE SECONDS. This is the rate of breathing of an average adult at rest.

b. Mouth-to-nose rescue breathing

- (1) The mouth-to-nose method is used if you cannot perform mouth-to-mouth breathing because the victim has a severe jaw fracture/mouth wound or his jaws are tightly closed by spasms.
- (2) Blow into the nose while you pinch the lips closed, or cover the mouth with your hand.
- (3) It may be necessary to separate the casualty's lips to allow air to escape during exhalation.
- (4) The rate of breaths is one every five seconds.
- (5) The mouth-to-nose technique requires the rescuer to blow almost twice as hard as in the mouth-to-mouth technique.

c. Chest pressure/arm lift method

- (1) The chest-pressure/arm-lift method is used when operating in an NBC environment and the casualty and rescuer are masked.
- (2) Place the casualty in a face-up position. Maintain an open airway by placing something under the casualty's shoulders to raise them several inches, allowing his head to drop backward.
- (3) Kneel at the top of the casualty's head. Grasp the victim's wrists and cross them over his or her lower chest in the same location as you place your hands for CPR. (See Figure 5.)
- (4) Rock forward until your arms are almost straight up and down. Allow the weight of the upper part of your body to push with steady, even, downward pressure. This forces air out of the casualty's lungs.
- (5) Immediately release the pressure by rocking back. Pull the casualty's arms outward and upward over his or her head and backward as far as possible. This should allow air to flow into the lungs.
- (6) Repeat this cycle about 12 times per minute. Check the airway often for obstructions and foreign matter. Keep the airway clear.

7. **Cardiopulmonary resuscitation (CPR)**

a. If, during the course of your primary assessment, you discover that the victim has no pulse and is not breathing, cardiopulmonary resuscitation is warranted. CPR is easily learned, but it must be performed correctly in order to provide the brain with oxygen and to avoid further injury to the victim.

b. It is possible to achieve effective artificial compression because the heart is located between the solid bone surfaces of the sternum (or breastbone) and the spine. However, as you compress the heart between these surfaces, you must be aware of the location of other vital organs lying under the breastbone and the ribs.

Figure 5. Locating proper hand position

c. Locating the point. (See Figure 5.) Run your fingers up the edge of the rib cage until your middle finger fits right into the notch in the center of the chest and your index finger is lying beside it across the lower end of the sternum (in line with the

chin).

- (1) Keep the middle finger in this notch and the index finger on the sternum (breastbone).
- (2) Place heel of the hand closest to the head on the sternum next to but not covering the index finger.
- (3) Place the second hand on top of the first.
- (4) Fingers may be interlaced or extended. Do not rest your fingers on the casualty's ribs.

NOTE: As you perform external cardiac compression you must apply enough pressure to compress the heart between the breastbone and spine without causing injury to the other organs lying in the same area. The ribs are quite fragile and can crack easily. The pressure of external cardiac compression on a broken bone could drive the splintered edges into the organs lying beneath it. The xiphoid tip is also a concern. The lower tip of the breastbone is called the xiphoid tip. Xiphoid, which means "sword shape," is an appropriate name for this tip because it is a bony point which extends beyond the main bone of the sternum and lies directly over the liver and stomach. Pressure on the xiphoid tip could drive it into these organs, causing serious injury.

d. Chest compressions

(1) Bend from your hips with your arms straight and compress the chest with your upper body weight falling straight down from your shoulders.

(2) Keep your shoulders over your hands and your elbows straight and locked. Remember, the position of the rest of your body is equally important for maximum effectiveness with minimal strain. External cardiac compression requires a good deal of exertion, and you must do it as efficiently as possible to maintain your energy and strength to keep the cardiac arrest victim alive.

(3) While keeping your hands in place on the chest, position your shoulders directly over the victim's sternum again without bending your arms. If you have very short arms you may have to kneel several inches away from the victim's side to achieve this position. You must keep your arms straight throughout compression. Bending the elbows tires you out much more quickly and requires a great deal more arm and shoulder strength than when you use your whole body to exert the downward pressure. Remember:

(a) Depress the sternum 1.5 to 2 inches for an adult.

(b) Between compressions, release the pressure completely.

(c) Do not lift your hands off the chest, and don't bounce against the chest or change your position in any way. (You would lose too much time in relocating the area for compression if you moved your hands; bouncing may injure ribs.) Just rock up and back from your hips and release the weight of your body. The sternum can then rise and allow the heart to refill.

(d) Count aloud to establish a rhythm: one-and-two-and-three-and-four-and....

(4) Cycle of compressions

(a) Give 15 compressions at the rate of 80-100 per minute, then two rescue breaths. Although the average pulse of an adult at rest is 60 - 80 beats per minute, we must compress at a more rapid rate to compensate for the pauses incurred during rescue breaths.

(b) Check the pulse and breathing after one minute (every fourth cycle) and then every two minutes thereafter.

(c) If a pulse returns but breathing does not, continue with rescue breathing at a rate of 12 breaths per minute.

e. When to stop. Continue rescue breathing or CPR until the casualty recovers, others help, you become too tired to continue, or the mission does not permit further efforts.

COMPLETE THE REVIEW QUESTIONS THAT FOLLOW

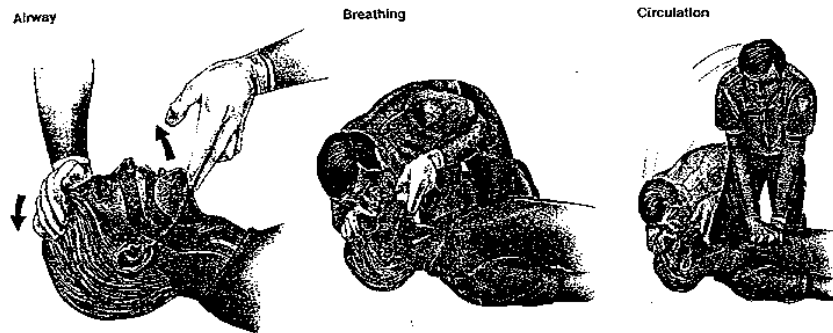
1. The most effective method of opening and maintaining the airway of an injured person is
2. Describe the steps taken to open the airway in an injured Marine.

- a.
- b.
3. In accident cases where a neck fracture is suspected, to avoid all forward, backward, lateral, or turning movements of the neck, it may be necessary to perform _____.
4. When examining a casualty for airway obstruction, you should tilt the head backwards and:
 - a. _____.
 - b. _____.
 - c. _____.
5. Identify the procedures, in order, for clearing the airway of an unconscious victim with an obstruction to breathing:
 - a. Tap victim; Ask
 - b. Open
 - c. Attempt
 - d. Retilt
 - e. Attempt
 - f. Perform
 - g. Probe
 - h. Attempt
 - i. Repeat
6. Identify the procedures of mouth-to-mouth artificial respiration.
 - a. Open
 - b. Look, _____, and
 - c. Pinch
 - d. Seal
 - e. Blow
 - f. Repeat
7. Identify the advantages of mouth-to-mouth and mouth-to-nose artificial respiration over chest pressure/arm lift method.
 - a. Oxygen given
 - b. Less
8. Identify the rate of breathing for the average person at rest:
9. Identify the rate of heartbeat for the average person at rest:
10. Identify the techniques of one-person CPR.
 - a. Open

- b. Restore
- c. Artificially
- d. Determine

ANSWERS:

1. the head tilt/chin lift method
2.
 - a. Tilt the head backward
 - b. Lift the lower jaw upward so that it juts forward
3. mouth-to-nose resuscitation
4.
 - a. LOOK for breathing movements
 - b. LISTEN for airflow at the mouth and nose
 - c. FEEL for air exchange
5.
 - a. Tap victim; Ask Are you O.K?
 - b. Open the airway
 - c. Attempt two breaths
 - d. Retilt the head
 - e. Attempt two more breaths
 - f. Perform 6 - 10 abdominal thrusts
 - g. Probe for unseen object in mouth/throat
 - h. Attempt two more breaths
 - i. Repeat the cycle as required
6.
 - a. Open airway
 - b. Look, listen, and feel
 - c. Pinch the nostrils closed
 - d. Seal the victim's mouth or nose with your mouth
 - e. Blow into the victim's mouth
 - f. Repeat breaths every 5 seconds
7.
 - a. oxygen given under positive pressure
 - b. Less fatiguing
8. Twelve times per minute or once every 5 seconds
9. 60 times per minute or once every second
10.
 - a. Open airway
 - b. Restore oxygen to the lungs
 - c. Artificially circulate blood and oxygen
 - d. Determine effectiveness of CPR



The ABC steps of cardiopulmonary resuscitation. Airway, Breathing, and Circulation are the essential components of basic life support.

Time is critical. If the brain is deprived of oxygen for 4 to 6 minutes, brain damage is likely to occur. After 6 minutes without oxygen, brain damage is extremely likely.

